

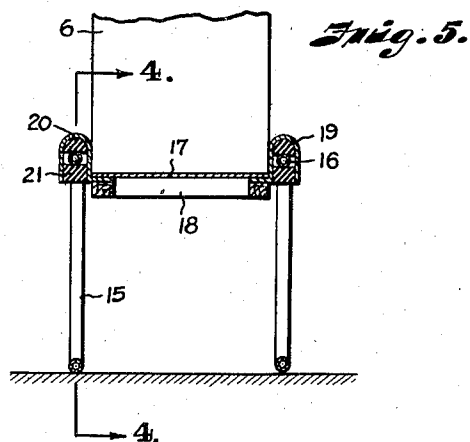
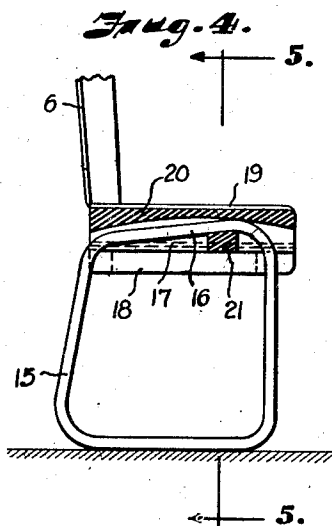
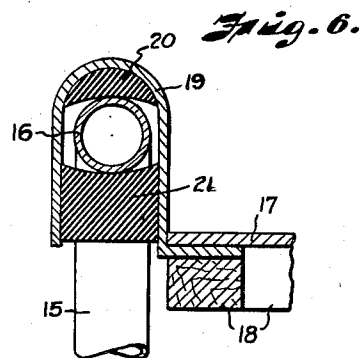
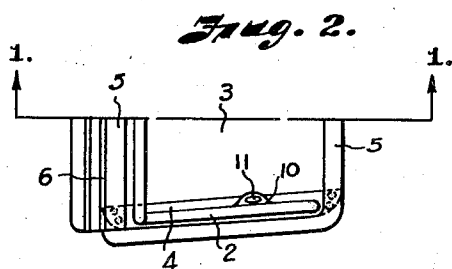
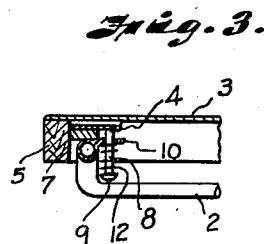
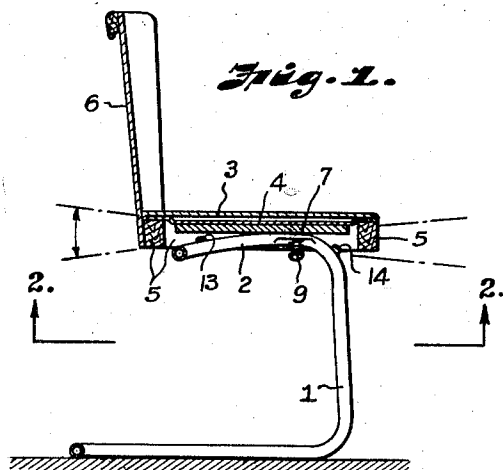
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M. STAM

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CHAIR WITH TILTABLE SEAT

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INVENTOR
Mart Stam
BY *Morris Spector*
ATTORNEY

UNITED STATES PATENT OFFICE

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CHAIR WITH TILTABLE SEAT

Mart Stam, Amsterdam, Netherlands, assignor
to Anton Lorenz, Zurich, Switzerland

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8 Claims. (Cl. 155-77)

This invention relates to chairs with tiltable seats.

It is one of the objects of the present invention to provide a rocking type chair wherein the amount of space required in front of and in back of the chair, to permit the necessary rocking or tilting action, is very small, whereby the chair is suitable for use at a dining table, an office desk, or typewriter table.

It is a further object of the present invention to provide a rocking type of chair wherein there is very little shifting of the center of gravity as the chair rocks between its alternate extreme positions.

In one embodiment of the present invention the above objects are attained by providing an under-frame with a convex rocking surface, upon which the seat rocks, the curved rocking surface being nearly level with the seat plate itself. The apex of the curved rocking surface is located substantially closer to the front thereof than to the back and the rocking surface is a continuous smooth curve substantially steeper forward of the apex than rearwardly thereof. By this arrangement an alteration of the inclination of the seat is obtained with only a slight forward or backward movement, so that the distance between the occupant of the chair and a table or desk in front of the occupant is only slightly changed.

By reason of this construction the chair is particularly well suited for use at a table or office desk. The chair may be, and preferably is, provided with means whereby the seat plate is brought back into a predetermined normal position, as for instance a horizontal position, when it is released from an inclined position.

The attainment of the above and further objects of the present invention will be apparent from the following specification taken in conjunction with the accompanying drawing forming a part thereof:

In the drawing:

Fig. 1 is a longitudinal sectional view through a chair constructed in accordance with the teachings of the present invention, said view being taken substantially along the line 1-1 of Fig. 2;

Fig. 2 is a fragmentary sectional view of the seat of the chair, as seen from below, said view being taken substantially along the line 2-2 of Fig. 1, and looking in the direction of the arrows;

Fig. 3 is a fragmentary part cross-section showing further details of the chair of Fig. 1;

Fig. 4 is a longitudinal sectional view illustrating another embodiment of the present invention, said view being taken substantially along the line

4-4 of Fig. 5, and looking in the direction of the arrows;

Fig. 5 is a cross-sectional view taken along the line 5-5 of Fig. 4, and looking in the direction of the arrows; and

Fig. 6 is an enlargement of a portion of Fig. 5.

Reference may now be had more particularly to the chair illustrated in Figs. 1, 2 and 3. The chair comprises an under-frame or base frame 1 of resilient metal tubing, the lower limb of which extends horizontally and is adapted to rest upon the floor. From the lower limb there extends a pair of risers bent back at the top to form upper limbs 2. The limbs 2, which are located at the opposite sides of the chair, constitute the oscillating rolling surfaces for supporting the seat. The limbs 2 are convex on their upper sides in the form of a smooth, continuous curve, the apex of which is located substantially closer to the forepart of the chair than to the back, and the curvature of which is substantially steeper forward of the apex than rearwardly thereof, all of which is apparent from Fig. 1. A seat plate 3 is supported by and oscillates on the convex surfaces of the limbs 2.

In the chair illustrated in Fig. 1, by way of example, a back 6 is rigidly connected with the seat so that it moves with the latter in its rocking motion. A depending border frame 5 is secured around the periphery of the seat plate 3. A horizontally extending plate 4 is secured to the inner side of the border frame 5 and is provided with a covering 7, on its under side, of hard wood, felt, or rubber, which rests on the limb 2 and constitutes a rolling surface co-operating with the convex rolling surface of the limb 2. To the plate 4 is also fastened a pin 8 which extends downwardly and has a head 9 at its lower end. The pin 8 passes through a slot 11 in a projection 10 secured to each limb 2 adjacent the apex thereof. The pin 8 is pressed downwardly by a spring 12 which bears against the head of the pin and against the projection 10. The spring provides a positive resilient connection between the seat plate and the under-frame and serves as a restoring force to restore the seat to a normal position, such as the position illustrated in Fig. 1. Rubber buffers 13 and 14 serve the purpose of limiting, without shock, the forward and backward inclination of the seat.

In the embodiment illustrated in Figs. 4 to 6 inclusive, the under-frame may comprise a pair of closed loops of wood or metal tubing. The upper limbs 16 of the loops serve as oscillating rocking surfaces on which the seat is supported

and rocks. The rocking surface 16 of this chair is of substantially the same shape as the corresponding rocking surface of the embodiment illustrated in Fig. 1, and comprises a convex curve, the apex of which is located substantially closer to the forepart of the chair than to the rear part thereof, and which curve is substantially steeper forwardly of the apex than rearwardly thereof.

A seat surface 17 is located below the level of the lateral oscillating surfaces 16. To that end the seat surface 17 is provided with a border frame 18 around the periphery thereof, which border frame is suspended from lateral groove parts 19 that embrace the convex rolling surfaces 16. The lateral groove parts 19 contain, at the top thereof, means 20 forming co-operating rolling surfaces that ride on the convex surface 16. The means 20 is in the form of a rubber lining or bearing. In addition, there is provided a rubber buffer 21 which is fastened in place in any desired manner, as by being glued in place, or being vulcanized in place, which rubber buffer or bearing 21 extends between the side walls of the grooved part 19.

It is apparent from Figs. 4 and 6 that if the chair is tilted forwardly or rearwardly from the position illustrated in Fig. 4, that the rubber buffer 21 is stressed by the under side of the curved roller 16. It therefore functions in the manner analogous to the spring 12 of the chair of Fig. 1 and serves to bias the inclination of the seat to a predetermined angle, horizontal in the construction illustrated in Fig. 4.

When the lateral parts 19 are arranged at a sufficiently high level they can serve also as arm rests, or they may support arm rests. Consequently, the arm rests are inclined together with the seat. However, if desired, the arm rests may be secured to the under-frame 15 and therefore remain fixed as the seat is tilted.

It is apparent that an under-frame such as is shown in Fig. 4 may be used on the chair in Fig. 1, or that the resilient restoring spring 12 of Fig. 1 may be used on the chair of Fig. 4. It is also apparent that the principles of the present invention may be applied to all kinds of furniture for seating purposes; for instance, revolving and/or swivel chairs, seats in vehicles, garden chairs, medical chairs, etc. It is also to be noted that the border frames 5 and the sides of the grooved parts 19 constitute protective means or guards, since they shield the engaging roller or rocking surfaces of the seat and frame and thereby preclude the possibility that one's fingers, clothing, etc., will become pinched between such rolling surfaces.

In compliance with the requirements of the patent statutes, I have here shown and described a preferred embodiment of my invention. It is, however, to be understood that the invention is not limited to the precise constructions here shown, the same being merely illustrative of the principles of the invention. What I consider new and desire to secure by Letters Patent is:

1. A chair having an under frame comprising means forming a ground engaging portion, an upwardly extending portion and an upwardly curved convex surface, a seat including a seat plate tiltably engaged with said surface, said surface having an apex in the fore half thereof and constituting a continuous curve sloping steeply from the apex toward the front and less steeply toward the rear, said seat plate being tiltable on to the steep portion forward of the apex as well as on to the less steep rearward portion and including a seat plate located substantially at the level

of the engaging surfaces, and elastic means for returning the seat to a predetermined position relative to the frame.

2. A chair comprising an under frame having upwardly curved convex surfaces, a seat plate, a grooved part associated with each surface and bent up at each side of the plate and carrying the plate, opposed bearings encased in each grooved part and being situated above the level of the plate, said bearings engaging respectively said convex surface and a surface of the frame opposite the convex surface and being elastic and arranged so as to return the seat plate to a predetermined position relative to the frame.

3. A chair comprising grooved arm rests open at the bottom thereof, a seat carried by said arm rests, a supporting frame having portions received in said grooved arm rests and tiltably supporting said arm rests and seat, said portions comprising a pair of upwardly convexly curved supporting surfaces on opposite sides of the chair, the apex of each convex curved surface being substantially closer to the front than to the rear of the curved surface and the curvature being continuous forwardly and rearwardly of the apex and substantially steeper forwardly of the apex than rearwardly thereof, and resilient connections between said supporting surfaces and arm rests and above and below said supporting surfaces for restoring said seat to a position between the limits of its tilting movement.

4. A chair comprising a supporting under-frame having spaced parallel convex rolling surfaces at the top thereof, the apex of each convex rolling surface being intermediate the ends thereof and curved downwardly from the apex both forward and rearward of the chair, the apex of the convex rolling surfaces being in the forward one-third of the curved surfaces and sloping downwardly more steeply forward of the apex than rearwardly thereof, a seat having rolling surfaces tiltably engaging the rolling surfaces of the frame and supported thereby, elastic means urging the seat to a substantially horizontal position but permitting tilting of the seat on the frame from such horizontal position, said seat having a border frame along the sides thereof adjacent to the seat rolling surfaces and extending from a point above the seat engaging surfaces to a point below the seat engaging surfaces.

5. A chair comprising a supporting base-frame having spaced parallel convex rolling surfaces at the top thereof, the apex of each convex rolling surface being intermediate the ends thereof and curved downwardly from the apex both forward and rearward of the chair, a seat assembly having rolling surfaces tiltably engaging the rolling surfaces of the frame and supported thereby, said seat assembly including side parts extending from a point above the convex rolling surfaces to a point therebelow, a border frame suspended from said side parts and a seating surface mounted on said border frame below said rolling surfaces of said seat assembly, and elastic means urging the seat assembly to a substantially horizontal position but permitting tilting of the seat assembly on the frame from such horizontal position.

6. A chair having a supporting under-frame comprising means forming two similar convex curved seat supporting surfaces on opposite sides of the chair, the means at each seat-supporting surface being bent downwardly and then horizontally to form a ground engaging length continuous with at least one of the seat supporting

surfaces, the apex of each convex curved surface being substantially closer to the front than to the rear of the curved surface and the curvature being continuous forwardly and rearwardly of the apex and substantially steeper forwardly of the apex than rearwardly thereof, a seat structure having rolling surfaces supported on the convex surfaces and adapted to roll forward of the apex on to the steeper portions of the convex surfaces as well as rearwardly of the apex, and protective covering means along the sides of the chair at the places where the seat rolling surfaces engage the convex surfaces.

7. A chair having a supporting under frame comprising members on opposite sides of the chair, the members on each side having a ground engaging portion bent upwardly at one end to form an upstanding portion which is bent at its upper end to form an approximately horizontal cantilever portion that is convexly curved to form a rolling seat support, the apex of each convex curved seat support being substantially closer to the front than to the rear of the curved surface and the curvature being continuous forwardly and rearwardly of the apex and being substantially

steeper forwardly of the apex than rearwardly thereof, a seat structure having surfaces supported and rolling on the convex surfaces and adapted to roll forward of the apex as well as rearwardly of the apex, and protective covering means along the sides of the chair where the seat rolling surfaces engage the convex surfaces.

8. A chair having a supporting under-frame which has two similar upwardly convexedly curved seat supporting surfaces on opposite sides of the chair, the apex of each convex curved surface being substantially closer to the front than to the rear of the curved surface and the curvature being continuous forwardly and rearwardly of the apex and substantially steeper forwardly of the apex than rearwardly thereof, a seat structure having rolling surfaces supported on the convex surfaces and adapted to roll forward of the apex on to the steeper portions of the convex surfaces as well as rearwardly of the apex, and protective covering means on the sides of the chair at the places where the seat rolling surfaces engage the convex surfaces.

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